

5 **MULTIPLE CATALYST AND REACTOR SYSTEM FOR OLEFIN
POLYMERIZATION AND POLYMERS PRODUCED THEREFROM**

ABSTRACT

10 This invention relates to a continuous process to produce a branched olefin
polymer comprising:

- 1) selecting a first catalyst component capable of producing a polymer
having an Mw of 100,000 or less and a crystallinity of 20% or less under selected
polymerization conditions;
- 15 2) selecting a second catalyst component capable of producing
polymer having an Mw of 100,000 or less and a crystallinity of 20% (preferably
40% or more) or more at the selected polymerization conditions;
- 3) contacting a catalyst component, one or more activators and one or
more C2 to C40 olefins in a first reaction zone, at a temperature of greater than
20 70°C, and at a residence time of 120 minutes or less; and
- 4) transferring the contents of the first reaction zone to a second
reaction zone and further contacting the contents with a catalyst component, an
activator and or one or more C2 to C40 olefins, at a temperature of greater than
70°C, and at a residence time of 120 minutes or less; and
- 25 5) optionally, transferring the contents of the second reaction zone to a
third reaction zone and further contacting the contents with a catalyst compound,
an activator and or one or more C2 to C40 olefins, at a temperature of greater than
70°C, and at a residence time of 120 minutes or less; and
- 30 6) recovering a branched olefin polymer comprising at least 50 mole%
of one or more C3 to C40 olefins,
where the first catalyst component is present in at least one reaction zone and the
second catalyst component is present in a second reaction zone and where in at
least one reaction zone the C2 to C40 olefin is a C3 to C40 alpha-olefin.